EPA/ROD/R05-95/288
1995

EPA Superfund
Record of Decision:

DOUGLASS ROAD/UNIROYAL, INC., LANDFILL
EPA ID: IND980607881
OU 01
MISHAWAKA, IN
07/13/1995

Declaration for the Record of Decision
Douglas Road Landfill
Landfill Cap Operable Unit

Site Name and Location

Douglas Road Landfill
Mishawaka, Indiana

Statement of Basis and Purpose

This is decision document presents the selected remedial action for the landfill cap operable unit at the Douglas Road Landfill Site (the Site) in Mishawaka, Indiana. This remedial action was selected in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. The selection of this remedy is based on the Administrative Record for the Site.

The State of Indiana concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health, welfare, or the environment.

Description of the Selected Remedy

This operable unit action is the first of two planned for this Site. It specifically outlines an action to address on-site soil and waste material contamination, which have been determined by the Remedial Investigation to pose unacceptable risks to human health and the environment.

The major components of the selected remedy include:

- Installation of a Composite Barrier Cap with a GCL Soil Barrier Layer, meeting the requirements of 329 IAC 2-14-19.
- Collection and disposal of landfill gas
- Perimeter ditches to collect surface water drainage
- Groundwater and source area monitoring to ensure that the goals of this action are met.

Declaration

The selected remedy is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements for this operable unit action, is cost effective, and consistent with achieving a permanent remedy. This operable unit action utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the principal threats of the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element. Subsequent actions at the site will address other threats posed by conditions at this site. Because this remedy will result in hazardous substances remaining on-site above health based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of this remedial action. Because this is the first of two operable unit actions at the site, review of this site and of this remedy will be continuing as EPA continues to develop other remedial alternatives for this site.

_____ _____

Date

Valdas V. Adamkus
Regional Administrator

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live

Evan Bayh
Governor

Kathy Prosser
Commissioner

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Mr. Valdas Adamkus
Regional Administrator
United States Environmental
Protection Agency
77 West Jackson Blvd
Chicago IL 60604

Dear Mr. Adamkus:

Re: Record of Decision
Operable Unit Two of
Site Remedy
Douglas Road Landfill
Mishawaka, IN

The Indiana Department of Environmental Management has reviewed the U.S. Environmental Protection Agency's Record of Decision for the Douglas Road Landfill Superfund site. IDEM fully concurs with the major components of the selected remedy for Operable Unit Two of this site which include:

Placment of a composite barrier cap with a GCL soil barrier layer. The typical cross section for this composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner, a GCL soil barrier layer having a maximum permeability of 1 x 10(-8) cm/s, and a bedding layer.

We also agree that this action attains Federal and State requirements that are applicable, or relevant and appropriate to this final site remedy. Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure the remedy continues to provide adequate protection of human health and the environment.

IDEM staff have been working closely with Region V staff in the selection of an appropriate final remedy for the Douglas Road Landfill and are satisfied that the selected alternative for Operable Unit Two of this site adequately addresses the risks to human health and the environment posed by the soils.

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Record of Decision

Please be assured that IDEM is committed to accomplish cleanup of all Indiana sites on the NPL and intends to fulfill all obligations required by law to achieve that goal.

Sincerely,

Kathy Prosser
Commissioner

cc: Susan Bremer, IDEM
Dion Novak, US EPA

Decision Summary
Douglas Road Landfill
Mishawaka, Indiana

Site Name, Location and Description

Douglas Road Landfill
Mishawaka, Indiana

The Douglas Road Landfill site (The Site) is located in St. Joseph County just north of Mishawaka, Indiana. The site is approximately 16 acres in size and is located near the northwest corner of Douglas and Grape Roads. The Site is bounded by the right-of-way for the Indiana State Toll Road to the north, a shopping center and an apartment complex to the east, residential properties and Douglas Road to the south, and agricultural land to the west (See Figure 1).

Site History and Enforcement Activities

In the early 1950s, the property was excavated and gravel onsite was used for the construction of the interstate. Uniroyal Plastics, Inc. (Uniroyal) leased the gravel pit and used it as a repository for plant wastes between 1954 and 1979. From 1954 to 1971, solvents, fly ash, paper, wood stock, rubber and plastic scrap were disposed of at the landfill. Only fly ash was disposed of from 1971 to 1979. In December 1979, the site was closed to avoid having to comply with impending RCRA regulations pertaining to the operation of a landfill.

According to the information provided by Uniroyal, about 302,400 gallons of RCRA hazardous waste were disposed of at the landfill. Liquid wastes included methyl ethyl ketone, acetone, tetrahydrofuran, toluene, hexane, and xylene. Historical aerial photographs of the landfill indicate several pits containing liquid that may have been used for disposal; the largest (and longest used) was in the central area of the landfill (See Figure 1) .

The landfill was nominated for inclusion on the NPL on June 10, 1986, and placed on the NPL on March 31, 1989. In September, 1989, the State of Indiana and Uniroyal signed a consent decree, in which Uniroyal agreed to perform a RI/FS at the site. Before completion of this work, Uniroyal filed for bankruptcy and discontinued work at the site (November 1991).

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Following the bankruptcy, it was determined that U.S. EPA should regain the site lead and the RI/FS was began in early 1994, using Superfund money. These investigations were completed in the fall of 1994.

Highlights of Community Participation

Public participation requirements under CERCLA Sections 113 (k) (2) (B) (i-v) and 117 were satisfied during the RI/FS process. U.S. EPA has been primarily responsible for conducting the community involvement program for this Site, with the assistance of the Indiana Department of Environmental Management (IDEM). The following public participation activities, to comply with CERCLA, were conducted during the RI/FS.

- A Community Involvement Plan was developed in 1994, to assess the community's informational needs related to the Douglas Road Landfill site and to outline community involvement activities to meet these needs. Residents and community officials were interviewed and their concerns were incorporated into this plan.

- A public information repository was established at the Mishawaka - Penn Public Library.

- A mailing list of interested citizens, organizations, news media, and elected officials in local, county, State and Federal government was developed. Fact sheets and other information regarding site activities were mailed periodically to all persons or entities on this mailing list. This mailing list has been updated on a continual basis as more individuals have become aware of the contaminated residential well problem.

- A Fact Sheet was mailed to the public in April 1994, that announced a public meeting to discuss the upcoming Remedial Investigation and answer site related questions from the public.

- A public meeting on April 20, 1994, at the Walt Disney School in Mishawaka announced the beginning of the Remedial Investigation and provided details about ita conduct.

- A fact sheet was mailed to the public in September 1994, that announced an availability session on Septepber 28, 1994, to discuss sampling results from the Remedial Investigation.

- An Availability Session was held on September 28, 1994 at the Walt Disney School to discuss RI progress and answer questions from the public regarding residential well contamination discovered during the RI.

- A fact sheet was mailed to the public in March 1995 that announced an availability session on March 8, 1995, to discuss the solution to the residential well contamination problem.

- An Availability Session was held on March 8, 1995, at the Walt Disney School, to discuss the solution to the residential well contamination problem.

- A fact sheet was mailed to the public in April 1995 that summarized EPA's recommended remedial alternative for the landfill capping phase of the cleanup in a proposed plan for the site. The EPA approved Feasibility Study was also released at that time. This fact sheet announced a public comment period for the proposed remedial action and was accompanied by newspaper advertisements in the local newspapers.

- A Public Meeting was held on April 5, 1995, at the Walt Disney School, to present EPA's proposed plan for the landfill capping phase and to receive formal public comment.

- Paid newspaper advertisements announced the meetings and availability sessions.

A Reponsiveness Summary addressing comments and questions received during the public comment period on the RI/FS and the Proposed Plan is included with this Record of Decision as Appendix A.

This Record of Decision presents the selected remedial action for the Douglas Road Landfill site in Mishawaka, Indiana, chosen in accordance with CERCLA, as amended by SARA, and the National Contingency Plan. The decision for this Record of Decision at the site is based on the Administrative Record.

Scope and Role of the Selected Remedy

As with many Superfund sites, the problems at the Douglas Road site are complex. A RI/FS was performed including activities to determine the nature and extent of contamination at the site and evaluating the feasibility of various remedial alternatives to clean up the site. The RI/FS determined that soil and waste materials and area groundwater had become contaminated because of past disposal activities at the site.

This Record of Decision (ROD) addresses contaminated soil and waste materials. These areas were determined to pose risks to human health and the environment due to dermal contact or incidental ingestion of site surface soils.

This is the first of three planned response actions at the site.

Subsequent actions will be taken to provide a city water extension to residential properties affected by site contamination, and to address remediation of groundwater contaminated by the site. This operable unit will be designed to be consistent with any and all potential future cleanup actions at the site.

Site Characteristice

The RI/FS was conducted to identify the types, quantities and locations of contaminants at the site and to develop alternatives that best address these contamination problems. The nature and extent of actual or potential contamination related to the site was determined by a series of field investigations, including:

- development of detailed information regarding historical site operations

- on-site surface soil sampling

- performance of a geoprobe survey to aid in the optimal placement of groundwater monitoring wells

- installation and sampling of groundwater monitoring wells, both on-site and off-site
- identification and sampling of existing groundwater wells in the site vicinity
- preparation of a site-wide human health and ecological risk assessment
- contaminant fate and transport modeling and analysis

Site Geology:

The Douglas Road Landfill site is underlain by unconsolidated glacial deposits ranging from 30 to 200 feet thick. The glacial deposits consist of sand and gravel outwash, interbedded with clayey tills fonmed by the Saginaw Lobe of the Wisconsinan glacial event. In the site area, an intermediate deposit of clay till separates the sand and gravel outwash into upper and lower units. This clay unit has an irregularly sloping scoured surface, dipping northwest, with a bottom elevation ranging from 600 feet msl near the Michigan state line to 675 feet msl near Mishawaka.

A basal clay till unit is also observed throughout the area, directly overlying the bedrock. Soils on the landfill surface consist of a well-drained sandy loam material, intermixed with areas of gravel, fly ash, coal and sand.

Site Hydrogeology

Within the St. Joseph River the sand and gravel outwash deposits described above form St. Joseph aquifer system. Recharge to the aquifer is generally from direct precipitation and losses from surface water bodies. The intermediate clay till deposit separates the aquifer system into upper and lower zones.

South Bend and Mishawaka are the primary users of groundwater in the county, with a combined average of 34 million gallons per day (mgd). Private water supplies rely exclusively on the aquifer, with an estimated use of 3.7 mgd. Other uses, such as industrial and agricultural, total about 2 mgd.

Groundwater at the site was detected between 15 and 20 feet below ground surface with the intermediate clay till separating the aquifer into upper and lower zones across much of the site. Groundwater use in the vicinity of the site is private residential, with the exception of a nearby nursery, which uses roundwater for irrigation.

Soil Contamination

A sampling grid consisting of 22 sampling locations was established along the length of the landfill. Composite surficial soil samples were sampled for semi-volatile organics (SVOCs), pesticides/polychlorinated biphenols (PCBs), metals/cyanide, and total organic carbon (TOC). Fourteen samples were also sampled for BTU, and two of the samples that appeared to contain flyash were analyzed for dioxin. A grab sample for volatile organics (VOCs), tetrahydrofuran (THF), and hexane analyses was collected from each sample also.

In addition to the 22 grid point sampling locations, six grab samples were collected from areas of suspected contamination because of currently observed stressed vegetation. These samples were analyzed for VOCs, THF, hexane, SVOCs, pesticides/PCBs, metals/cyanide, TOC, BTU and dioxin.

Surficial soil samples collected at the site were found to be contaminated with volatile organics up to levels of 20,000 parts per billion (ppb), semi-volatiles up to levels of 160,000 ppb, PCBs up to levels of 16,000 ppb, dioxin up to levels of 1.3 ppb, pesticides up to levels of 68 ppb, and metals up to levels of 1920 ppb.

Groundwater Contamination

Groundwater samples collected at the site were found to be contaminated with volatile organics up to levels of 15,000 ppb, semi-volatile organics up to levels of 29 ppb, and metals up to levels of 15 ppb.

Groundwater samples collected from residential wells were found to be contaminated with volatile organics up to levels of 100 ppb.

Summary of Site Risks

This Record of Decision is written for an operable unit action to address the contaminated soils and waste materials at the site. The RI report contains a Risk Assessment, prepared by CH2M Hill using the Risk Assessment Guidance for Superfund and approved by EPA as a portion of the RI report, that calculated the actual or potential risks to human health and the environment that may result from exposure to site contamination. Risks associated with exposure to contaminated groundwater will be summarized in a subsequent ROD to address contaminated groundwater.

The risk assessment determined that the majority of risks associated with exposure at the site were attributed to dioxin, PCBs, PAHs and bis (2-ethyl hexyl) phthalate.

Actual or threatened releases of hazardous substances from this site not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

Toxicity Assessment

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (mg/kg-day)(-1) are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal to human extrapolation and uncertainty factors have been applied (e.g. to account for the use of animal data to predict effects on humans).

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intaken of chemicals from environmental media (e.g. the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g. to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimace the potential for adverse noncarcinogenic effects to occur.

The following hazardous substances were found to be of principal concern at the site.

Polynuclear Aromatic Hydrocarbons Animal studies indicate that PAHs may be potentially harmful to the gastrointestinal tract, liver and kidneys and may suppress the immune system after both short and long term exposure. Birth defects and decreased body weight have been reported in laboratory animals, although reproductive toxicity associated with PAH exposure has not been demonstrated in humans. Lung and skin cancer in humans have been associated with chronic exponure by inhalation and dermal contact, respectively, to mixtures of compounds including carcinogenic PAHs.

Arsenic Short term exposures to arsenic or arsenic compounds may cause effects in the gastrointestinal tract, heart, vascular system, blood, nervous system, eye, nose and skin. Arsenic compounds are reported to act as skin allergens in humans. Exposure to arsenic has also been reported to cause depression of the bone marrow and disturbances in the blood cell and tissue forming system and has been associated with kidney and liver disorders. Arsenic has been found to be a lung carcinogen when inhaled and to cause skin cancer when ingested. Arsenic and its compounds may have potential reproductive and developmental effects in humans. Teratogenic effects have been demonstrated in animal species exposed to arsenic via oral administration or intraperitoneal injection. Damage to genetic material has been reported in humans.

Polychlorinated Biphenols (PCBs) The principal toxicological effects observed in humans exposed to PCB mixtures include effects of the skin and the liver. Results from experimental studies in animals indicate that PBCs may also cause effects on the thyroid gland and immune system. Liver tumors have been obeerved in animals exposed to high concentrations of PBCs. Epidemiological studies of PCB exposed populations have not demonstrated a causal relationship between PCB exposure and any form of human cancer. Reproductive toxicity has been reported in animals exposed to PBCs prior to and during gestation. Adverse developmental effects have been reported in the newborn of women exposed during pregnancy to PCBs and other chemicals in an occupational setting or from ingestion of contaminated fish.

Dioxin Toxic effects include liver damage, thymic atrophy, gastric hemorrhage, testicular degeneration, weight loss, pericardial edema, and kidney and hematological effects. Humans exposed to dioxin by industrial accidents reported nausea, vomiting, headaches, fatigue, muscular aches and joint pains, peripheral neuropathy, loss of libido, and irritation of eyes, respiratory tract and skin.

Bis (2-ethyl hexyl) phthalate Chronic exposure at relatively high concentrations have retarded growth and resulted in increased liver and kidney weight in experimental animals. Some evidence exists in animals of teratogenic and ferotoxic effects. Reproductive effects, decreased fertility and testicular damage have been noted in rodents. Phthalates are poorly absorbed through the skin and are rapidly metabolized.

Risk Assessment

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1 x 10(-6) or 1E-6). An excess lifetime cancer risk of 1 x 10(-6) indicates that, as a plausible upper bound, an individual has a one in one million chance of developing cancer as a result of site related exposure to a carcinogen over a 70 year lifetime under the specific exposure conditions at a site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ)(or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

Carcinogenic risks described in the risk assessment for exposure to contaminated surface soil at the site were computed for several potential exposure scenarios, including residential child, residential adult, teenage trespasser, and occupational adult exposures. The combined pathways carcinogenic risk for surface soil exposure at the site exceeds 1 x 10(-6) for all receptor groups, ranging from 2.4 x 10(-4) for adults engaged in occupational activities to 2 x 10(-6) for a teenage trespasser. The principal carcinogenic risk contributors are dioxin, PCBs, PAHs, and bis (2-ethyl hexyl) phthalate (See Table 1).

The non-carcinogenic risks associated with future exposure to contaminated surface soil at the site were computed for the same exposure scenarios as were used for the carcinogenic risks. Generally, total Hazard Indices (HI) are used to calculate non carcinogenic risks and must be below a value of 1.0; otherwise U.S. EPA policy requires remedial action. The assessment of future non-carcinogenic risks shows a combined ingestion, dermal, and inhalation hazard index ranging from 0.009 for a teenage trespasser to 27.08 for adults in a residential setting (See Table 1).

Douglas Road (Uniroyal) Landlill
Mishawaka, Indiana
Surface Soil

Table 1
Summary of Risks

Media	Land Use	Receptor	Exposure Route	Cancer Risk	Hazard Index	Major Chemical Contributors to Risk
Carcinogenic Risk		Noncarcinogenic Risk				
Surface Soil	Current	Trespassing	Ingestion & Inhalation	1E-06	0.05	Dioxin Dioxin
	(No Land Use)	Teenager	Dermal	1E-06	0.03	Polychlorinaled biphenyls Chromium
			TOTAL	2E-06	0.09	Arsenic Antimony
						Benzo(a)pyrene Arsenic
Surface Soil	Residential	Child	Ingestion & Inhalation	3E-04	21.1	Beryllium Bis(2-ethylhexyl)phthalate
			Dermal	1E-04	5.9	Diben(a,h)anthracene Nickel
			TOTAL	5E-04	27.1	Bis(2-ethylhexyl)phthalate
						Benzo(b)fluoranthene
Surface Soil	Residential	Adult	Ingestion & Inhalation	2E-04	2.3	Benzo(a)anthracene
			Dermal	3E-04	2.8	
			TOTAL	5E-04	5.1	
Surface Soil	Occupational	Adult	Ingestion & Inhalation	5E-05	0.8	
			Dermal	2E-04	2.0	
			TOTAL	2E-04	2.8	

An ecological risk assessment determined whether the contaminants present at the site and evaluated potential threats to ecological receptors in the absence of any remedial actions.

The results of this assessment, as summarized in the risk assessment portion of the RI, determined that due to exposure to site contaminants, ecological damage from surface soil contamination is likely in the absence of any remedial actions.

Description of Alternatives

A Focused Feasibility Study (FFS) was completed for this site using the presumptive remedy guidance, which calls for the analysis of a very limited number of cleanup options for the site remediation. During the FFS, a list of alternatives was developed that could be used to address the threats and/or potential threats identified for the soil at the site. The list of alternatives was screened based on criteria for effectiveness (i.e. protection of human health and the environment, reliability), implementability (i.e. technical feasibility, compliance with applicable Federal and State regulations) and relative costs (i.e. capital, operation and maintenance).

Following this initial screening, the list of alternatives was evaluated and only alternatives that met the nine criteria, listed below in the comparative analysis section, were submitted for detailed analysis. The Hydrologic Evaluation of Landfill Performance (HELP) model was used to evaluate the performance of each capping alternative for inhibiting infiltration of rainwater, which assisted with the comparison of each alternative to the no action alternative.

Alternative 1 No Action

Under this alternative, no remediation would occur and the site would remain in its present condition. This alternative will not reduce any potential public health or environmental risks currently associated with the site. This alternative will include access and deed restrictions limiting the future use of groundwater and surface water at the site and limiting future site development. The inclusion of the no action alternative is required by law to give U.S. EPA a basis for comparison.

Present Worth Cost: $200,000
Time to Implement: 2-4 weeks

Alternative 2: Soil Cap

This alternative consists of placement of a soil cap, which will be constructed to prevent direct contact with landfill contents, to prevent volatilization and fugitive dust emissions from surficial soil contamination, to control surface water runoff and erosion, and to reduce infiltration into the landfill thereby reducing potential releases into the groundwater. The typical cross section for the soil cap consists of: (from top to bottom) topsoil and locally available soil. In addition to the soil cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost: $2,400,000
Time to Implement: 2 months

Alternative 3A: Single Barrier Cap with Compacted Clay Soil Barrier

This alternative consists of placement of a single barrier cap with a compacted clay soil barrier. The typical cross section for a single barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimmm permeability of 1 x 10(-2) cm/s, a compacted clay soil barrier layer with a maximum permeability of 1 x 10(-7) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost: $5,400,000
Time to Implement: 4 months

Alternative 3B Single Barrier Cap with GCL Barrier

This alternative consists of placement of a single barrier cap with a Geosynthetic Clay Liner (GCL) barrier. The typical cross section for a single barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a GCL barrier layer with a maximmm permeability of 1 x 10(-8) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost: $4,500,000
Time to Implement: 3 months

Alternative 4A Composite Barrier Cap with a Compacted Clay Soil Barrier Layer

This alternative consists of placement of a composite barrier cap with a compacted clay soil barrier. The typical cross section for a composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner, a compacted clay soil barrier layer with a maximum permeability of 1 x 10(-7) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost: $5,800,000
Time to Implement: 5 months

Alternative 4B Composite Barrier Cap with a GCL Soil Barrier Layer

This alternative consists of placement of a composite barrier cap with a GCL soil barrier layer. The typical cross section for a composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner, a GCL soil barrier layer with a maximum permeability of 1 x 10(-8) cm/s, and a bedding layer. In addition to the cap, access restrictions will be implemented to restrict site use and access. These restrictions will include deed restrictions to control site development and groundwater use and fencing to inhibit unauthorized access to the landfill property.

Present Worth Cost: $4,700,000
Time to Implement: 4 months

Summary of the Comparative Analysis of Alternatives

The nine criteria used by U.S. EPA to evaluate remedial alternatives, as set forth in the NCP, 40 CFR Part 300.430, include: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARs); long-term effectiveness; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost; state acceptance; and community acceptance.

THRESHOLD CRITERIA

Protection of Human Health and the Environment

Addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Alternative 1 would not protect human health and the environment because it does not reduce risks associated with exposure to contaminated media at the site. There are, since it has been determined that Alternative 1 would not be protective of human health and the environment or meet ARARs, it will no longer be considered in the nine criteria evaluation.

Alternatives 2, 3A, 3B, 4A, and 4B would reduce the threats to human health and the environment by placement of a cover material over the contaminated landfill materials.

However, Alternatives 3A, 3B, 4A, and 4B offer greater protection than Alternative 2 because of greater protection against potential future groundwater migration through reduction in rainwater infiltration. Alternatives 3B and 4B offer greater protection than Alternatives 3A and 4A due to the increased

protectiveness of the cover materials resulting in lower levels of infiltration, which increases long term effectiveness.

Alternative 2, due to lower levels of long term effectiveness and increased short term infiltration rates is not as effective as the other alternatives.

Alternatives 3A, 3B, 4A, and 4B are functionally equivalent with respect to this threshold criterion, however, Alternatives 3B and 4B are slightly more effective due to increased protectiveness of the cover materials which translates into slightly higher levels of long term effectiveness and permanence.

COMPLIANCE WITH ARARs

Addresses whether a remedy will meet all of the ARARs of other Federal and State environmental laws and/or justifies a waiver of those laws.
All of the alternatives are capable of meeting their respective ARARs. ARARs for the landfill closure include landfill closure cover requirements and air emissions requirements. Alternative 2 includes the installation of a vegetated soil cap and does not meet the Subtitle D capping ARAR, nor can a waiver of these requirements be justified. Alternatives 3A, 3B, 4A, and 4B meet or exceed the minimum RCRA Subtitle D and State performance standards (See Table 2).

Table A-1
DRL Site Landfill Operable Unit
Federal and State ARARs

Remedial Activity and Applicable Alternatives	Federal ARAR	State ARAR	Comment
Waste classification for landfill contents (all alternatives)	40 CFR, Part 261: Identification and Listing, of Hazardous Waste, Subparts A (General), B (Criteria), C (Characteristics), and Appendices.	329 IAC Article 3.1, Rules 1, 4-6.	Establishes that RCRA hazardous wastes were disposed in landfill, and soils mixed with waste are hazardous.
Hazardous Waste Landfill Closure and Post-Closure Care (all alternatives)	40 CFR Part 264, Subpart N (264.310 Closure and Post-Closure Care, and 264.301 Design and Operating Requirements and 264.117 Post-Closure Use).	329 IAC Article 3.1, Rule 9	Performance standards for new RCRA landfills require covers that minimize infiltration and has a permeability no greater than 1 X 10-7 cm/s. Post-closure use of property restricted as necessary to prevent damage to cover.
Solid Waste Landfill Closure and Post-Closure Care (all alternatives)	40 CFR Part 258.60	329 IAC Article 2-14-19	Federal performance standards for new landfills require 18 inches of 1 X 10-5 cm/s or less layer, with 6 inches of topsoil. State regulations specify 2 feet of compacted clay with 6 inches of topsoil. May be deemed relevant and appropriate.
Stormwater Control Requirements (Alternatives 2-4)		327 IAC Article 15, Rule 5: Storm Water Run-off Associated with Construction	Applicable.

Table A-1
DRL Site Landfill Operable Unit
Federal and State ARARs

Remedial Activity and Applicable Alternatives	Federal ARAR	State ARAR	Comment
Point Source Discharge Requirements for Containment (Alternatives 2-4)		327 IAC Article 15, Rule 6: Stormwater Discharge Associated with Industrial Activity	May be relevant and appropriate.
Air Emissions Requirements (Alternatives 2-4)	40 CFR 50.6, Standards		Particulate Emmission 326 IAC: Air Pollution Control dust. Applicable to emissions of "clean" Fugitive dust emissions may not exceed 67 percent of upwind concentrations, or 50 :g/m3 above background, or be visible at the property line. Health-based dust emission control levels may be lower, and are considered TBCs.
Board Regulations	Article 6-4, 6-5, Fugitive Dust Emissions		

BALANCING CRITBRIA

Long Term Effectiveness

Addresses any expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup standards have been met.

All of the alternatives involve leaving wastes in place and the long term effectiveness and permanence is entirely dependent on the durability and maintenance of the covers and caps and the ability to limit infiltration of rainwater.

Alternatives 2, 3A, 3B, 4A, and 4B provide both access restrictions and containment technologies, including caps and surface controls. The capping systems incorporated by Alternatives 2, 3A, 3B, 4A and 4B provide similar levels of protection from direct contact with the landfill contents.

Alternatives 2, 3A, 3B, 4A, and 4B will prevent direct contact with the landfill contents, will control surface water runoff and erosion, and will prevent volatilization and fugitive dust emissions from surficial soil contamination.

Alternative 2 will prevent contact with the landfill contents but will not limit the infiltration of rainwater. Alternatives 3A, 3B, 4A, and 4B will prevent contact with the landfill contents and will also limit the infiltration of rainwater to prevent contamination of groundwater from the landfill contents. This limitation on infiltration will decrease the transport of contaminants to the groundwater, which will assist in long term groundwater remediation by limiting the amount of contaminants migrating into the groundwater.

Alternatives 3A, 3B, 4A, and 4B are functionally equivalent with respect to this balancing criterion and are superior to Alternative 2-because of long term reliability and reduction of rainwater infiltration. However, Alternatives 4B provides higher levels of infiltration protection than Alternatives 3A, 3B, and 4A, resulting in greater long-term effectiveness and permanence.

Reduction of Toxicity, Mobility or Volume (TMV) through Treatment

Addresses the anticipated performance of the treatment technologies a remedy may employ.

All of the alternatives will reduce the mobility of groundwater contamination at the site by reducing the amount of rainwater that can infiltrate into the landfill and leach contaminants from the landfill contents. None of the alternatives provides reduction of toxicity, mobility or volume through treatment, though Alternatives 4A and 4B do the most to reduce mobility and volume by containment and reductions in the amount of rainwater that can infiltrate into the landfill contents.

Alternative 4B provides the greatest reduction in infiltration and therefore, provides the best reduction of TMV, slightly higher than for Alternatives 3A, 3B and 4A. Therefore, although it has been determined that Alternatives 2, 3A, 3B and 4A are functionally equivalent with respect to this balancing criterion, Alternative 4B shows a slightly higher level of effectiveness.

Short Term Effectiveness

Addresses the period of time needed to achieve protection and any negative effects on human health and the environment that may be posed during the construction and implementation period, until cleanup standards are achieved.

All of the alternatives include fencing to restrict site access to effectively prevent or reduce risks to potential trespassers. Alternatives 2, 3A, 3B, 4A, and 4B result in higher short term exposures over no action as a reault of workers being involved in grading and other capping activities at the site. Alternative 2 could be completed in approximately 1-2 months, Alternative 3A could be completed in approximately 4 months, Alternative 3B could be completed in approximately 3 months, Alternative 4A could be completed in approximately 5 months, and Alternative 4B could be completed in approximately 4 months.

Short term impacts from the construction of these alternatives include site grading and capping activities and their potential to disturb surface soils and subsurface wastes. All of the capping alternatives will be required to follow the same safety precautions to protect the construction workers, the community, and the environment from the short-term impacts resulting from the remedial actions. Basic safety precautions will include site workers wearing personal protective equipment, decontaminating equipment before leaving the

site, implementing dust control measures such as frequent watering of construction areas and roads, monitoring ambient air around the perimeter of the landfill for migration of airborne contaminants from the site, enforcing safe speed limits on the construction site, maintaining noise control devices on construction equipment, and providing facilities for construction workers to eat and clean up to minimize ingestion and inhalation of contaminants.

Alternatives 3B and 4B are more effective in the short term due to the lack of a locally available clay source for the capping requirements of Alternatives 3A and 4A. Also, the installation of the capping requirements of Alternatives 3A and 4A are more weather dependent for successful completion than those for Alternatives 3B and 4B. This becomes more important because the timeframe for installation of the cap necessitates construction in times when weather may hinder performance.

Therefore, it has been determined that Alternatives 3B and 4B are functionally equivalent and superior to Alternatives 2, 3A, and 4A, primarily because of the lack of a locally available clay source and the greater tolerance to adverse weather conditions.

Implementability

Addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed for a particular option to be put in place.

The implementability of the alternatives is based on availability of materials to construct the caps and the ease in obtaining administrative permits to perform the work. Implementing Alternatives 2, 3A, 3B, 4A, and 4B entails managing construction activities, locating and ordering materials for construction, and obtaining permits related to the remedial action.

Materials for Alternatives 2, 3B, and 4B are readily available while the clay layer component of Alternatives 3A and 4A lacks a locally available source.

Weather related concerns also impact implementability of the alternatives. Alternatives 3A and 4A depend on the placement of a compacted clay layer, which cannot be constructed in inclement weather. Alternatives 3B and 4B cover construction is not as weather dependent as the other alternatives as the placement of the membrane and geosynthetic layer can be accomplished under adverse weather conditions.

Therefore, Alternatives 3B and 4B have been determined to be functionally equivalent with respect to this balancing criterion, and are superior to Alternatives 2, 3A and 4A.

Cost

Included are capital costs, annual operation and maintenance costs (assuming a 30 year time period), and net present value of capital and operation and maintenance costs. The selected remedy must be cost effective.

The FS presented net present worth cost estimates for each of the seven alternatives brought forward for detailed analysis. These estimates were derived from literature, vendor quotations, actual costs from similar projects, and standard cost information sources. Cost estimates are provided primarily for the purpose of conducting a comparative assessment between remedial options, in order to assess the economic feasibility of the different alternatives.

Table 5-2
Cost Estimate Summary

Alternative	Capital Cost	Operations Cost	Total Present Worth
1	$180,000	$20,000	$200,000
2	$2,000,000	$400,000	$2,400,000
3A	$5,000,000	$400,000	$5,400,000
3B	$4,100,000	$400,000	$4,500,000
4A (w/60-mil HDPE)	$5,800,000	$400,000	$6,100,000
4A (w/30-mil PVC)	$5,500,00	$400,000	$5,800,000
4B (w/60-mil HDPE)	$4,600,000	$400,000	$5,000,00
4B (w/30-mil PVC)	$4,300,000	$400,000	$4,700,000

Where limited or insufficient information was available regarding site-specific hydrogeologic characteristics or contaminant specific treatability efficiencies, assumptions were made based on literature and professional judgement where necessary to develop costs associated with different processes. The cost estimates provided in the FS are expected to provide an accuracy of +50/-30 percent (See Table 3).

Therefore, based on an analysis of the costs associated with all of the alternatives analyzed in the FS, Alternative 2 is the least expensive of all of the alternatives and Alternatives 4A and 4B are the most expensive.

MODIFYING CRITERIA

State Acceptance

Addresses whether or not the State agency agrees to or objects to any of the remedial alternatives, and considers State ARARs.

The Indiana Department of Environmental Management (IDEM) has been intimately involved with the Site throughout the RI/FS, has attended all technical progress meetings, has been provided opportunity to comment on technical decisions, and concurs with the selection of Alternative 4B as the selected remedy for the Site.

Community Acceptance

Addresses the public's general response to the remedial alternatives and proposed plan.

Throughout the RI/FS at the Site, community involvement has increased significantly over time. U.S. EPA has been accessible and responsive to community concerns throughout the study. This has been accomplished by a community relations program consisting of periodic fact sheets highlighting site progress and availability sessions with the community to communicate site information and to answer questions regarding site progress.

At the public meeting, the majority of those in attendance, as well as the majority of those who submitted written comments regarding the proposed plan, were in favor of Alternative 4B as the most appropriate choice for this action. Specific comments on the proposed cleanup plan are addressed in Appendix A, the Responsiveness Summary.

In summation, Alternative 1 is unacceptable for protection of human health and the environment. Alternatives 3B and 5B fully satisfy the nine evaluation criteria with the exception of reduction of toxicity, mobility and volume through treatment. However, these two alternatives would provide reduction in the toxicity of contaminants through groundwater treatment and reduction in the mobility of contaminants through capping. Alternatives 2, 3A and 4A are not as effective in the long term at reducing the mobility of contaminants through capping.

Alternatives 3B and 4B are more effective in the short term than Alternatives 3A and 4A due to the lack of locally available clay deposits to use in the construction of the cap and the time and effort necessary to place and compact these materials during cap installation. Alternatives 3B and 4B are easier to implement than Alternatives 3A and 4A because of the more readily available GCL liner materials compared with the lack of locally available clay. Alternative 4B provides greater long term protection of landfill contents from precipitation infiltration than Alternative 3B, which will benefit long term remediation of contaminated groundwater coming from the site, which will help to ultimately reduce the risks posed by the landfill contents.

Therefore, the best balance among the seven alternatives, while providing for protection of human health and the environment and long term effectiveness and permanence, is Alternative 4B, Composite Barrier Cap with a GCL Soil Barrier Layer.

Selected Remedy

U.S. EPA has selected Alternative 4B - Composite Barrier Cap with a GCL Soil Barrier Layer, as the appropriate soil cleanup remedy for the Douglas Road site. This alternative was selected because it is the most appropriate alternative for this operable unit action and is compatible with the final remedial alternative selected for groundwater remediation, because of the reduction in rainwater infiltration provided by the selected response action.

The objective of this operable unit action is to remediate on-site source areas that are contributing to

contamination of both soils and groundwater. The FFS contains a description of this alternative. The components of this alternative include site preparation, institutional controls, groundwater monitoring, and placement of cap materials.

Site preparation will consist of clearing and grubbing activities, with the trees and shrubs shredded and placed evenly over the site prior to placement of the gas collection layer.

Access restrictions will be inplemented to control site use and access. Access restrictions for this alternative include deed restrictions, which will be sought to limit the use of the site for construction or other site development, and will prohibit the use of groundwater beneath the site for any purpose, and fencing to inhibit unauthorized access to the landfill property, and to protect the remedy components. Warning signs stating the hazards within the landfill area will also be placed along the property boundary as necessary.

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The typical cross section for the composite barrier cap consists of (from top to bottom): a topsoil layer, a protective soil layer, an aggregate or sand drainage layer with a minimum permeability of 1 x 10(-2) cm/s, a flexible membrane liner (20 mil minimum), a GCL soil barrier layer with a maximum permeability of 1 x 10(-8) cm/s, and a gas collection layer. The cap will be graded at 3 percent (minimum) slopes in the direction of flow to promote surface drainage from the site and the cap will be revegetated to control erosion. Perimeter ditches will be used to collect and store surface drainings (See Figure 2).

The construction of Alternative 4B will meet at a minimum the requirements of 329 IAC 2-14-19 with the need for additional cover materials to be evaluated during the remedial design of the remedy.

Gas collection shall be provided by installing vent pipes into the fill. The collected gas shall be disposed of by flaring or venting. Final gas management requirements will be determined during remedial design.

After construction, regularly scheduled maintenance of the cap will be performed. These activities will include mowing and perimeter ditch maintenance. Maintenance of the perimeter ditches includes removal of silt and debris which may accumulate in the ditches and obstruct drainage of stormwater from the site.

Interim groundwater monitoring shall be conducted until the final groundwater remedy ia selected to monitor existing conditions. This monitoring shall consist of a combination of RI-installed monitoring wells as well as selected residential wells to maintain the existing information regarding groundwater impacts from the landfill. The details of this program, including frequency and location, will be developed during remedial design.

Because hazardous substances will remain in place at the site, U.S. EPA will review the remedial action every five years to determine its effectiveness.

Documentation of Significant Changes

The Proposed Plan for this remedial action was released for public comment on March 23, 1995. The Proposed Plan identified Alternative 4B, Composite Barrier Cap with GCL Soil Barrier Layer, as the preferred remedial alternative. No significant changes have been made since the release of the Proposed Plan.

Statutory Determinations

In accordance with the statutory requirements of Section 121 of CERCLA, as amended, remedial actions taken pursuant to Sections 104 and 106 must satisfy the following:

1. Be protective of human health and the environment.

2. Comply with all ARARs established under federal and state environmental laws (or justify a waiver).

3. Be cost effective.

4. Utilize permanent solutions and alternative technologies or recovery technologies to the maximum extent practicable.

5. Satisfy the statutory preference for remedies that utilize treatment and also significantly reduce the

toxicity, mobility and volume of the hazardous substances, pollutants, or contaminants.

In addition, CERCLA § 121(c) requires five year reviews to determine if adequate protection of human health and the environment is being maintained where remedial actions result in hazardous substances remaining on-site above health-based levels. The selected remedy for the Douglas Road Landfill Site achieves these requirements as discussed in detail below.

Protection of Human Health and the Environment

The selected remedy for the source control operable unit achieves the requirement of being protective of human health and the environment by containing the source contamination and isolating it from the environment. Baseline cancer risks from the site exceed the 10-4 to 10-6 acceptable risk range established by EPA in the NCP. Deed restrictions will ensure that future land use of the source area will not impose an unacceptable risk. Non-carcinogenic risks will be reduced to levels less than the EPA standard of 1.0, through institutional, and source control measures.

Compliance with ARARs

The selected alternative complies with all chemical, action and location specific applicable or relevant and appropriate requirements (ARARs) for the Site. A detailed discussion of the ARARs and to be considered (TBCs) is presented above and a complete list of ARARS and TBCs is in the Focused Feasibility Study.

Chemical-Specific ARARs

Chemical-Specific ARARs do not exist for contaminated source soils at the Site. TBCs, such as reference concentrations and potency factors were evaluated as part of the risk analysis for the Site. The selected alternative will meet the TBC based clean-up goals for the source area.

Action-Specific ARARs

The selected alternative complies with the several action-specific ARARs identified for the Site. The action-specific ARARs define acceptable treatment and disposal procedures for hazardous substances. Because of the nature of the contamination and its disposal before November 19, 1980, RCRA is a relevant and appropriate requirement for the selected alternative. RCRA Subtitle C requires new landfill caps to have a permeability less than or equal to the bottom liner system (approximately 1x10-7 cm/s). RCRA Subtitle D requires an 18 inch cover with permeability of no less than 1x10-5. Indiana Administrative Code Subtitle D has additional specific composition and slope requirements for a landfill cap. The selected alternative meets or exceeds the federal and state Subtitle D requirements.

Location-Specific ARARs

There are no location specific ARARs that apply to the Site for this operable unit.

Cost Effectiveness

The selected alternative is slightly higher in cost than most of the low permeability capping alternatives, however, the benefits of the increased effectiveness at limiting rainwater infiltration which will benefit the remedial action selected for the groundwater portion of this remedy makes the selected alternative a cost effective choice.

Utilization of Permanent Solutions and Alternative Treatment

The isolation of the source material by a cap does not meet the preference for permanent solutions and alternative treatments. Use of a permanent solution, such as removal or treatment of the source material was deemed impractical due to the volume of the contaminated material and the high cost of treatment.

Preference for Treatment

The selected alternative does not meet the preference for treatment. Treatment of the waste was deemed impracticable, due to the large volume and heterogeneous nature of the contamination. Because of these conditions, the presumption for containment was considered appropriate for this site and treatment was eliminated an an option.

APPENDIX A

Douglas Road Landfill
Michigan City, Indiana

Responsiveness Summary

I. Responsiveness Summary Overview

In accordance with CERCLA Section 117, a public comment period was held from March 23, 1995 to April 24, 1995, to allow interested parties to comment on the United Stated Environmental Protection Agency's (U.S. EPA's) Focused Feasibility Study (FFS) and Proposed Plan for the Douglas Road Landfill Superfund site (the Site). At a April 5, 1995 public meeting, EPA and Indiana Department of Environmental Management (IDEM) officials presented the Proposed Plan for remediation for the landfill capping phase at the Site, answered questions and accepted comments from the public. Written comments were also received through the mail.

II. Background of Community Concern

The Douglas Road Landfill operated from 1954 to 1979 as a repository for Uniroyal plant wastes. From 1954 to 1971, solvents, fly ash, paper, wood stock, rubber and plastic scrap were disposed of at the landfill. Only fly ash was disposed of from 1971 to 1979.

The Site was nominated for inclusion on the NPL on June 10, 1986 and placed on the NPL on March 31, 1989. In September, 1989, the State of Indiana and Uniroyal signed a consent decree in which Uniroyal agreed to perform a RI/FS at the site. Before completion of this work, Uniroyal filed for bankruptcy and discontinued work at the site (November 1991). Following the bankruptcy, it was determined that U.S. EPA should regain the site lead and the RI/FS was began in early 1994, using Superfund money.

During the RI, it was diecovered that residential wells in the vicinity of Douglas Road and State Road 23 were contaminated with vinyl chloride and trichloroethylene (TCE), contaminants that had been identified as coming from the site. These residents received the following temporary measures to provide protection until a permanent remedy could be implemented for the affected wells: for those with vinyl chloride contamination, residents received portable air strippers and for those with TCE contamination, residents received in-line filters.

Community involvement has increased as the extent of the off-site groundwater plume and the number of residential wells impacted by site contamination has been determined. This has led to more people becoming aware of activities at the site and attending the informational meetings.

III. EPA's Proposed Remedy and its Relation to the Final ROD

In a Proposed Plan that was issued on March 23, 1995, U.S. EPA (EPA) proposed Alternative 4B, Composite Barrier Cap with GCL Soil Barrier Layer for the landfill capping phase of the cleanup. This remedy was based on the information presented in the FFS, prepared by CH2M Hill, the EPA contractor, and reviewed and approved by EPA. During the public comment period, EPA received several comments regarding the proposal of Alternative 4B, all of which were favorable.

EPA will respond to these public comments, demonstrating that public concerns play a large role in Superfund remedy selection.

IV. Summary of Significant Comments Received During the Public Comment Period and EPA Responses

The comments are organized into the following categories:

A. Summary of comments agreeing with the proposed remedy choice.

1. Comments were raised agreeing with the selection of Alternative 4B for this phase of the cleanup.

EPA Response 1: EPA appreciates the support for the proposed remediation approach for the landfill cap phase of this cleanup. EPA agrees that the proposed remedy is the most appropriate long term solution for this phase.

2. Comments were raised regarding the potential future migration of contaminated groundwater away from this

site.

EPA response 2: EPA shares these concerns regarding potential future impacts on area groundwater. The installation of the cap will eliminate the possibility of rainwater soaking through the landfill contents, which is how this site has contaminated groundwater in the past. This, coupled with the next phase of cleanup, which will remediate the contaminated groundwater, will eliminate the migration of contaminated groundwater away from this site.

3. A number of commentors expressed a desire to be hooked up to city water as soon as possible to avoid any contact with the contaminated groundwater.

EPA response 3: EPA agrees with the commentors and is taking the steps necessary to provide city water as soon as possible. Right now, funding for the water line project is temporarily unavailable. EPA had planned to use funding which would have been provided from it's Headquarters office located in Washington, D.C. to design and construct the water line extension. This money has been frozen by EPA Headquarters in anticipation of Congressional budget cuts. Congress is in the process of re-examining EPA's overall budget for potential budget cuts Agency wide. It is hoped that following this process, the project will be funded. Once monies become available, the water line extension will be designed and constructed in a several months, hopefully later this year.

4. A commentor raised a number of concerns regarding the groundwater phase and it's interrelation with the proposed capping portion of the Site cleanup.

EPA response 4: EPA appreciates the input and suggestions for characterizing and cleaning up area groundwater. EPA will factor these concerns into any future plans for groundwater cleanup. As was stated in the meeting, the proposed capping of the landfill is closely interrelated with future cleanup plans for area groundwater.

EPA proposed this capping alternative because it's implementation will greatly augment future groundwater cleanup. EPA will propose a final remedy for area groundwater cleanup this summer, for which the commentor and the rest of the public will have the opportunity to provide input to the EPA.

The comments are paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript which is available in the public information repository, which is located at the Mishawaka-Penn Public Library. Written comments received at EPA's regional office are on file in the Region 5 office. A copy of these written comments has also been placed in the aforementioned repositories.

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
DOUGLAS ROAD LANDFILL SITE
MISHAWAKA, INDIANA
ORIGINAL
06/13/95

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	00/00/00	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Cover Letter Forwarding Various Background Informatin Documents	3
2	10/05/79	Carpenter, R., Uniroyal, Inc.	Trost, P., St. Joseph County Health Department	Letter re: Termination of Landfill Operations w/Attachments Documenting Disposal Practices	34
3	10/24/80	Carpenter, R., Uniroyal, Inc.	Trost, P., St. Joseph County Health Department	Letter re: Closure of Douglas Road Landfill w/Attachments	20
4	00/00/85	U.S. EPA	File 1970-1985	Uniroyal Historical Groundwater Data	75
5	06/00/87	U.S. EPA	File	Correspondence, Water Well Records and Sampling Data Relating to the Harvey Residential Well from 1970-1987	123
6	08/00/89	USDHHS/USPHS/ATSDR	Public	Public Health Statement: "Vinyl Chloride"	7
7	12/00/90	IDEM	Public	Fact Sheet: "Environmental Investigation Begins"	6
8	06/00/91	Eder Associates Consulting Engineers, P.C.	U.S. EPA	Progress Report #1	49
9	07/00/91	Eder Associates Consulting Engineers, P.C.	U.S. EPA	Progress Report #2	22
10	04/15/93	U.S. EPA	File	Statement of Work for Conducting an RI/FS (HANDWRITTEN ANNOTATIONS)	27
11	06/11/93	Warren, W., Eder Associates Consulting Engineers, P.C.	Schafer, G., U.S. EPA	Letter re: Eder's Response to U.S. EPA's 104(e) Information Request w/Attachments	134

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
12	07/13/93	Schafer, G., U.S. EPA	Nathan, S., U.S. EPA	Memorandum re: RPM's Notes from the June 28, 1993 Kickoff Meeting with CH2M Hill	3
13	07/19/93	Schafer, G., U.S. EPA	Addressees	Cover Memorandum Forwarding the Draft RI/FS Work Plan	1
14	07/22/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Cover Letter Forwarding Three Boxes of Raw Analytical Data	1
15	07/27/93	Helmer, E., U.S. EPA	Schafer, G., U.S. EPA	Memorandum re: Ecological Review of the Draft RI/FS Work Plan	2
16	08/11/93	Nathan, S., U.S. EPA	Sandoval, M., U.S. EPA	Memorandum Forwarding Attached August 11, 1993 Statement of Work (Revision 1)	37
17	08/11/93	Schafer, G. and Nathan, S., U.S. EPA	File	Memorandum re: Summary of Discussions Held at the June 28, 1993 Kickoff Meeting with CH2M Hill	4
18	08/11/93	Gorski, W., U.S. EPA	Figliulo, I., U.S. EPA	Memorandum re: Wetlands Regulatory Unit's Review of the Draft RI/FS Work Plan	1
19	08/18/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Cover Memorandum Forwarding Various Documents re: the Quality Assurance Project Plan	1
20	08/19/93	Watters, E., U.S. EPA	Traub, J., U.S. EPA	Memorandum re: Water Division's Review of the RI/FS Work Plan	3
21	08/23/93	Kasarabada, P., IDEM	Schafer, G., U.S. EPA	Letter re: IDEM's Review Comments on the RI/FS Work Plan	4
22	08/24/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Letter re: U.S. EPA/IDEM's Review Comments on the Draft RI/FS Work Plan	5
23	09/14/93	Plomb, D. and Ohland, C., CH2M Hill	Schafer, G., U.S. EPA	Memorandum re: DRL Meeting Minutes (FASP and Geoprobe)	3
24	09/17/93	Schafer, G., U.S. EPA	Addressees	Memorandum re: Summary of September 2, 1993 Minutes from the FASP/Geoprobe Meeting	4
25	11/01/93	CH2M Hill	U.S. EPA	Report: Work Plan for the RI/FS	95
26	11/05/93	Plomb, D., CH2M Hill	Schafer, G., U.S. EPA	Cover Letter Forwarding the Quality Assurance Project Plan, Field Sampling Plan, and Health and Safety Plan	1

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
27	11/05/93	CH2M Hill	U.S. EPA	Health and Safety Plan	26
28	12/09/93	Schafer, G., U.S. EPA	Plomb, D., CH2M Hill	Letter Forwarding Attached CH2M Hill's Comments on the Draft Quality Assurance Project Plan w/Attachments	35
29	01/11/94	Henne, D., U.S. DOI	Novak, D., U.S. EPA	Letter re: U.S. DOI's Review Comments on the Draft RI Report	3
30	03/04/94	CH2M Hill	U.S. EPA	Quality Assurance Project Plan for the RI/FS	371
31	03/22/94	Traub, J., U.S. EPA	Various Property Owners	Letters to Eleven Property Owners Requesting Access to Property w/Attached Blank "Consent to Access to Property" Form	44
32	04/04/94	Novak, D., U.S. EPA	Lopat, B., Jennings Realty, Inc.	FAX Transmittal re: Access to the Lake Shore Estates Property w/Attached Signed "Consent for Access to Property" Form	2
33	04/25/94	Plomb, D., CH2M Hill	Novak, D., U.S. EPA	Letter re: Results of Geoprobe Investigation and Proposed Well Locations	2
34	05/04/94	Various Property Owners	U.S. EPA	Ten "Consent for Access to Property" Forms Signed Between March 24-April 5, 1994	10
35	05/06/94	Peterson, S., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Results of Samples Collected April 11-18, 1994	45
36	08/00/94	U.S. EPA	File Data	Round 1 Chain of Custody Records and Sampling	76
37	08/00/94	U.S. EPA	File Data	Round 2 Chain of Custody Records and Sampling	87
38	08/01/94	Plomb, D., CH2M Hill	Novak, D., U.S. EPA	Letter re: Results of Residential Well Sampling	2
39	08/30/94	Theisen, K., U.S. EPA	South Bend Residents	Letters to Eleven Residents re: Results of August 25, 1994 Residential Well Sampling for Vinyl Chloride	11
40	08/30/94	Theisen, K., U.S. EPA	South Bend Residents	Letters to Five Residents re: Results of August 12, 1994 Sampling of Residential Well Water for Vinyl Chloride	5
41	09/06/94	Novak, D., U.S. EPA	Michael, E., St. Joseph County Health Department	FAX Transmittal Forwarding List of Addresses in Area of SR 23 / Dougles Road w/Attached Maps	4

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
42	09/08/94	Novak, D., U.S. EPA	Mishawaka Residents	Letters to Five Residents re: Summary of Results of April 11, 1994 Residential Well Sampling	12
43	09/08/94	Novak, D., U.S. EPA		South Bend Residents Letters to Four Residents Re: Summary of Results of May 23 and April 11, 1994 Residential Well Sampling	8
44	09/16/94	Tavitas, N., ATEC Associates, Inc.	Doran, M., Riedel Environmental Services	Letter Forwarding Attached Results of the Organic Analyses for Thirteen Samples (Round 3)	46
45	09/19/94	Krieg, D., Ecology & Environment, Inc.	Theisen, K., U.S. EPA	FAX Transmittal Forwarding Chain of Custody Records and Field Sample Data Sheets for Residential Well Sampling w/Attachments	22
46	09/23/94	CH2M Hill	U.S. EPA	Technical Memorandum #1: Summary of Field Investigation Data Collection Activities	58
47	10/11/94	Theisen, K., U.S. EPA		South Bend Residents Letters to Eleven Residents re: Results of September 13, 1994 Residential Well Sampling for VOCs	11
48	12/10/94	Novak, D., U.S. EPA	Ostrodka, S., U.S. EPA	Cover Memorandum Forwarding the Risk Assessment	1
49	12/15/94	Plomb, D., CH2M Hill	Novak, D., U.S. EPA	Cover Letter Forwarding the Agency Review Draft of the RI Report	1
50	10/03/95	Podowski A., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Technical Support Section's Review Comments on the Baseline Risk Assessment w/Attachments	9
51	01/05/95	Micheal, E., St. Joseph County Health Department	Novak, D., U.S. EPA	Letter re: SJCHD's Request to U.S. EPA to Conduct Water Sampling to Verify the Effectiveness of the Water Filtration Devices w/Attached Documents from the SJCHD's Douglas Road Site File	17
52	01/11/95	Theisen, K., U.S.EPA		South Bend Residents Letter to Eight Residents re: Results of November 21, 1994 Residential Well Sampling for VOCs	8
53	01/11/95	Morrow, W., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Technical Support Section's Review Comments on the RI Report	3

DOC#	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
54	01/11/95	Chapman, J., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Technical Support Section's Review Comments on the Agency Review Draft RI Report	2
55	01/20/95	Theisen, K., U.S. EPA	South Bend Residents	Letter to Two Residents re: Results of November 14, 1995 Residential Well Sampling for VOCs	2
56	01/20/95	Theisen, K., U.S. EPA	South Bend Residents	Letters to Two Residents re: Results of November 21, 1995 Residential Well Sampling Vor VOCs	2
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66	02/27/95	Plomb, D., CH2M Hill	Novak, D., U.S. EPA	Letter re: CH2M Hill's Response to U.S. EPA's Comments on the Agency Review Draft of the RI Report	13
67	02/28/95	Environmental Health Laboratories	St. Joseph County Health Department	Laboratory Report re: One Drinking Water Sample and One Laboratory Trip Blank	5
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69	03/01/95	Novak, D., U.S. EPA	Addressees Report	Cover Memorandum Forwarding the Final RI	1
70	03/02/95	Novak, D., U.S. EPA	Addressees	Cover Memorandum Forwarding the Draft Porposed Plan for Review	1
71	03/09/95	Grejda, H., IDEM	Novak, D., U.S. EPA	Letter re: IDEM's Review Comments on the Second Draft of the FFS Report	2
72	03/10/95	Grejda, H., IDEM	Novak, D., U.S. EPA	Letter re: IDEM's Review Comments on the First Draft of the Proposed Plan	3
73	03/10/95	Henne, D., U.S. DOI	Novak, D., U.S. EPA	Letter re: U.S. DOI's Review Comments on the Draft Proposed Plan	5
74	03/13/95	Wright, D., ISDH	Novak, D., U.S. EPA	Memorandum re: ISDH's Review Comments on the Draft Proposed Plan	1
75	03/14/95	Marrero, J., U.S. EPA	Novak, D., U.S. EPA	Memorandum re: Air Toxic and Radiation Branch's Review Comments on the Draft Proposed Plan	1
76	03/15/95	U.S. EPA	Public	Public Notice re: Announcement of April 5, 1995 Public Meeting and March 23-April 24, 1995 Public Comments Period	1
77	03/20/95	Novak, D., U.S. EPA	Plomb, D., CH2M Hill	Letter re: U.S. EPA's Review of the Revised FFS Report	1
78	03/21/95	Grejda, H., IDEM	Novak., D., U.S. EPA	Letter re: IDEM's Review Comments on the Second Draft of the RI Report	5
79	04/04/95	Grejda, H., IDEM	Novak, D., U.S. EPA	Letter re: IDEM's Review Comments on the First Draft of the Work Plan for Remedial Design	2
80	04/07/95	Beutter, R., City of Mishawaka	U.S. EPA/OPA	Letter re: Mayor's Comments Concerning the Proposed Plan	2
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82	04/28/95	Rummel Reporting Service	U.S. EPA	Transcript: April 5, 1995 Public Hearing	53

U.S. EPA ADMINISTRATIVE RECORD
REMEDIAL ACTION
DOUGLAS ROAD LANDFILL SITE
MISHAWAKA, INDIANA
GUIDANCE ADDENDUM
06/13/95

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1	05/16/89	U.S. EPA		Index: "Compendium of CERCLA Response Selection Guidance Documents" (Attached) [Guidance Documents are Incorporated by Reference and May be Viewed at U.S. EPA Region 5, 77 W. Jackson Blvd., Chicago, IL 60604-3590]	12
2	09/00/93	U.S. EPA/OSWER	U.S. EPA	Quick Reference Fact Sheet: "Presumptive Remedy for CERCLA Municipal Landfill Sites" (OSWER Directive 9355.0-49FS; EPA 540-F-93-035)	14

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